

In the Claims

1. (Original) An image processing apparatus which renders, in a screen coordinate system, unit figures each constituting the surface of a three-dimensional object to be rendered, comprising:

a rasterizing unit which divides a unit figure into a plurality of unit areas on the screen coordinate system and outputs the unit areas;

an area divider which divides each of the unit areas output from the rasterizing unit into a plurality of subareas;

an area discarder which discards as necessary a subarea obtained by the division by the area divider according to a predetermined rule; and

an area writer which writes a subarea that survived the discarding process by the area discarder into a memory.

2. (Original) The image processing apparatus according to claim 1, wherein the area writer re-merges subareas that survived the discarding process and writes merged areas obtained by re-merges in the memory.

3. (Original) The image processing apparatus according to claim 2, wherein each of the merged areas has the same size as the unit area.

4. (Original) The image processing apparatus according to claim 1, wherein the size of the subarea corresponds to a unit throughput in which the area writer writes the subareas into the memory at a time.

5. (Original) The image processing apparatus according to claim 2, wherein, of the subareas that survived the discarding process by the area discarder, the area writer merges subareas derived from unit areas having the same coordinates in the screen coordinate system before the division.

6. (Original) The image processing apparatus according to claim 2, wherein the area writer refers to information indicating the relative position of a subarea in the unit area to which the subarea belonged before the division and writes the subarea in an address in the memory corresponding to the information.

7. (Original) The image processing apparatus according to claim 1, wherein the unit area is a rectangular area,

the rasterizing unit divides a rendering area so that each of the plurality of unit areas includes a pixel group, the pixel number in the vertical direction and the pixel number in the horizontal direction of a pixel group in a given unit area being identical with the corresponding numbers of a pixel group in another unit area, and

the area divider divides the unit area including the pixel group into a plurality of subareas each including a small pixel group, the pixel number in the vertical direction and the pixel number in the horizontal direction of a pixel group in a given subarea being identical with the corresponding numbers of a pixel group in another subarea.

8. (Original) The image processing apparatus according to claim 7, wherein, of the plurality of subareas obtained by the division by the area divider, the area discarder discards a subarea that does not include any valid pixels.

9. (Currently Amended) The image processing apparatus according to claim 7 ~~or claim~~ 8, wherein, of the subareas that survived the discarding process by the area discarder, the area writer re-merges subareas which do not include valid pixels at identical coordinates in the screen coordinate system and writes merged areas obtained by re-merge in the memory.

10. (Original) The image processing apparatus according to claim 9, wherein, of the subareas that survived the discarding process by the area discarder, the area writer merges subareas derived from unit areas having the same coordinates in the screen coordinate system before the division.

11. (Original) The image processing apparatus according to claim 9, wherein the area writer refers to information indicating the relative position of a subarea in the unit area to which the subarea belonged before the division so as to write the subarea in an address in the memory corresponding to the information.

12. (Original) The image processing apparatus according to claim 7, wherein the area writer comprises a memory access unit which writes pixels included in the subarea into the memory in parallel.

13. (Original) An image processing method which renders, in a screen coordinate system, unit figures each constituting the surface of a three-dimensional object to be rendered, comprising:

rasterizing by dividing a unit figure into a plurality of unit areas on the screen coordinate system and outputting the unit areas;

dividing each of the unit areas output from the rasterizing into a plurality of subareas;

discarding as necessary a subarea obtained by dividing the unit area according to a predetermined rule; and

writing a subarea that survived the discarding into a memory.

14. (Original) The image processing method according to claim 13, wherein the rasterizing divides a rendering area so that each of the plurality of unit areas includes a pixel group, the pixel number in the vertical direction and the pixel number in the horizontal direction of a pixel group in a given unit area being identical with the corresponding numbers of a pixel group in another unit area, and

the unit area dividing divides the unit area including the pixel group into a plurality of subareas each including a small pixel group, the pixel number in the vertical direction and the pixel number in the horizontal direction of a pixel group in a given subarea being identical with the corresponding numbers of a pixel group in another subarea.

15. (Original) The image processing method according to claim 14, wherein, of the plurality of subareas obtained by the division, the discarding discards a subarea that does not include any valid pixels.

16. (Original) An image processing method which renders, in a screen coordinate system, unit figures each constituting the surface of a three-dimensional object to be rendered, comprising:

dividing a unit figure into a plurality of unit areas on the screen coordinate system and outputting the unit areas; and

generating merged areas by retrieving, from a plurality of subareas constituting each of the unit areas output from the dividing, subareas that include valid pixels.

17. (Original) An image processing method which renders, in a screen coordinate system, unit figures each constituting the surface of a three-dimensional object to be rendered, comprising:

dividing a unit figure into a plurality of unit areas on the screen coordinate system and outputting the unit areas; and

writing subareas, of a plurality of subareas constituting each of the unit areas output from the dividing, that include valid pixels into a memory in parallel.

18. (Original) A computer program product which renders, in a screen coordinate system, unit figures each constituting the surface of a three-dimensional object to be rendered, comprising:

a dividing module which causes a computer to divide a unit figure into a plurality of unit areas on the screen coordinate system and outputting the unit areas; and

a merging module which causes a computer to retrieve, from a plurality of subareas constituting each of the unit areas output from the dividing, subareas that include valid pixels so as to generate merged areas.

19. (Original) A computer program product which renders, in a screen coordinate system, unit figures each constituting the surface of a three-dimensional object to be rendered, comprising:

a dividing module which causes a computer to divide a unit figure into a plurality of unit areas on the screen coordinate system and outputting the unit areas; and

a writing module which causes a computer to write subareas, of a plurality of subareas constituting each of the unit areas output from the dividing, that include valid pixels into a memory in parallel.